1996 AIR CONDITIONING & HEAT

MANUAL A/C

A/C SYSTEM SPECIFICATIONS

A/C SYSTEM SPECIFICATIONS

Application	Specification
Compressor Type	Harrison HD6/HT6 6-Cyl.
Compressor Belt Tension (1)	105-125 lbs. (48-57 kg)
System Oil Capacity (2)	8 ozs.
Refrigerant (R-134a) Capacity	28 ozs.
System Operating Pressures (3)	
High Side	315 psi (22.1 kg/cm^2)
Low Side	36 psi (2.5 kg/cm^2)

(1) Replace belt tensioner if tension is below specification and indicator marks on tensioner align. Replace belt if marks do not align.

(2) Use PAG Refrigerant Oil (Part No. 12345923).

(3) With ambient temperature at 80°F (27°C) and relative humidity at 60 percent.

DESCRIPTION

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM procedures in AIR BAG article in the ACCESSORIES/SAFETY EQUIPMENT Section.

CAUTION: When battery is disconnected, radio will go into anti-theft protection mode. Obtain radio anti-theft protection code from owner prior to servicing vehicle.

SYSTEM DESCRIPTION

Electronically controlled, manually selected A/C-heater system delivers heated or cooled and dehumidified air for occupant comfort. System is a Cycling Clutch Orifice Tube (CCOT) design and uses a Harrison HD6 or HT6 6-cylinder radial compressor. Air distribution is controlled through an electronic A/C-heater control panel and a series of vacuum-operated doors. Blower speeds and temperature levels are manually selected through a sliding lever.

OPERATION

A/C-HEATER CONTROL PANEL

Several settings are possible on A/C-heater control panel to provide desired comfort level. See **Fig. 1**. Available mode settings are:

OFF

Blower does not operate in this mode. Air conditioning does not occur. With vehicle forward movement, a slight amount of air will enter passenger compartment.

A/C

The A/C-heater control panel sends and A/C request signal to Powertrain Control Module (PCM). The A/C-heater control panel will automatically switch air delivery to MIDDLE setting. Air delivery can be changed anytime after A/C is pressed. Recirculated conditioned air is distributed through dash registers.

RECIRC

Recirculated, conditioned air is directed through dash registers.

MIDDLE

Recirculated, conditioned air will be distributed through dash registers. This setting will self-activate whenever A/C or RECIRC switch is pressed.

BLEND

Conditioned air will be distributed through dash and floor registers.

FLOOR

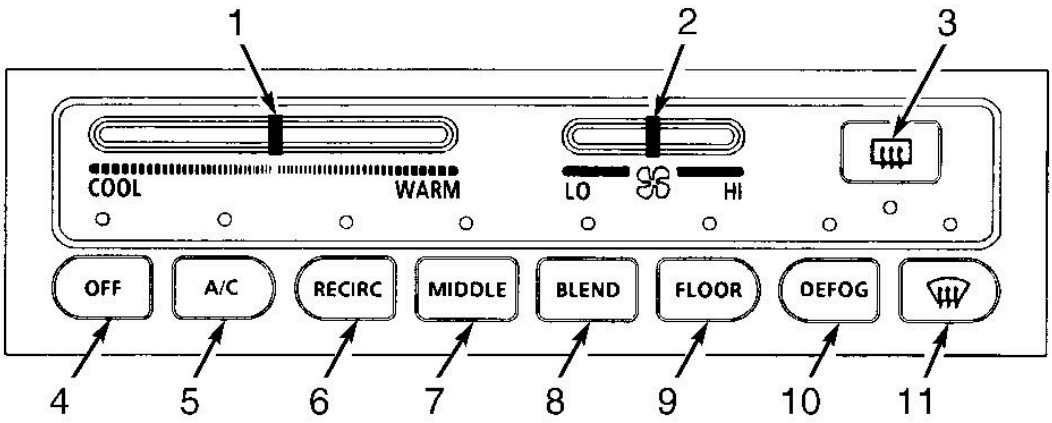
Conditioned air will be distributed through floor outlets only.

DEFOG

This setting provides a 50/50 mix of air between defroster outlet and floor outlet. This setting also requests A/C to the PCM.

Defrost

In defrost (symbol) position, a majority of conditioned air is distributed to windshield and side windows and a small bleed goes to floor outlets. This setting also requests A/C to the PCM.



1. Temperature Lever
2. Blower Motor Switch
3. Rear Window Defogger Switch
4. OFF Switch
5. A/C Switch
6. RECIRC Switch
7. MIDDLE Switch
8. BLEND Switch
9. FLOOR Switch
10. DEFOG Switch
11. Defrost Switch

94G37255

Fig. 1: Identifying Electronic A/C-Heater Control Panel
Courtesy of GENERAL MOTORS CORP.

AIR DELIVERY

With ignition switch in RUN position, voltage is applied through instrument panel fuse to A/C-heater control panel. Operating mode is determined by buttons on control panel. Ground signals determine which air valves are to be operated, as well as the position of the temperature valve. A vacuum/electric solenoid contains solenoid valves that control vacuum actuators. When solenoids are de-energized, the valves vent the actuators, allowing actuator to return to vent position.

HIGH SPEED BLOWER RELAY

The high speed blower relay is located next to blower motor on bottom of air conditioner module. High speed blower relay is used to by-pass blower motor resistor for high speed blower operation. When blower motor switch is in the HI position, the high speed blower relay is energized, applying battery voltage directly to blower motor.

A/C COMPRESSOR RELAY

A/C compressor relay is located on multi-use relay bracket on right front wheelwell, near accumulator. Powertrain Control Module (PCM) energizes A/C compressor relay for compressor operation. If PCM receives

a signal indicating Wide Open Throttle (WOT) or engine overheating, it will de-energize A/C compressor relay, stopping compressor operation. During hot engine restart, compressor engagement will not be allowed for 3 seconds to allow engine idle to stabilize.

ORIFICE TUBE

The orifice tube is located in an enlarged portion of condenser outlet pipe. It controls the flow of liquid refrigerant into the evaporator. The orifice tube has filter screens on both inlet and outlet sides. Tube has no moving parts and is not adjustable. If tube is plugged or defective, it must be replaced as a unit.

PRESSURE CYCLING SWITCH

The pressure cycling switch is located on accumulator. It senses low side system pressure and controls power circuit to A/C compressor relay. Pressure cycling switch is normally closed at pressures more than 43-49 psi (3.0-3.4 kg/cm^2), and open at pressures less than 23-25 psi (1.6-1.7 kg/cm^2).

POWER STEERING PRESSURE SWITCH

The power steering pressure switch is located in the power steering pressure hose. It temporarily shuts off the compressor when power steering loads exceed 500 psi (35 kg/cm^2) to improve engine idle.

REFRIGERANT PRESSURE SENSOR

The refrigerant pressure sensor is attached to the compressor and condenser hose. It senses high side pressures and sends a signal to the Powertrain Control Module (PCM). If high side pressure exceeds 429 psi (30.1 kg/cm^2), the PCM will disable the compressor.

TROUBLE SHOOTING

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM procedures in the article, AIR BAG RESTRAINT SYSTEM, in the ACCESSORIES/SAFETY EQUIPMENT section

NOTE: Also see A/C-HEATER SYSTEM TROUBLE SHOOTING - MANUAL article.

A/C COMPRESSOR CLUTCH CONTROLS

NOTE: See A/C COMPRESSOR CLUTCH CONTROLS article.

AIR FLOWS FROM WRONG OUTLETS

1. Turn ignition switch to RUN position. Using voltmeter, backprobe and measure voltage at vacuum/electric solenoid connector terminal No. 6 (Brown wire). If battery voltage is present, go to next step. If battery voltage is not present, repair open or short ground in Brown wire.

2. Turn ignition off. Disconnect vacuum/electric solenoid connector. Using ohmmeter, measure resistance between vacuum/electric solenoid terminal No. 6 (Brown wire) and vacuum/electric solenoid terminals No. 1 (Light Green/Black wire), 2 (Red wire), 3 (Purple wire), 4 (Tan wire), and 5 (Light Blue wire). If resistance is 70-120 ohms for all terminals, go to next step. If resistance is not 70-120 ohms for all terminals, check vacuum/electric solenoid connections. If connections are okay, replace vacuum/electric solenoid.
3. Connect vacuum/electric solenoid connector. Set ignition to RUN position. Turn A/C-heater control panel off. Using voltmeter connected to battery voltage, backprobe and measure voltage at vacuum/electric solenoid terminals No. 1 (Light Green/Black wire), 2 (Red wire), 3 (Purple wire), 4 (Tan wire), and 5 (Light Blue wire). If battery voltage is present at terminal No. 4 and zero volts is present at terminals No. 1, 2, 3 and 5, go to step 5). If voltage is not as specified, go to next step.
4. Check Tan wire for open or short to battery voltage. Check for short to ground in Light Green/Black wire, Red wire, Purple wire, and Light Blue wire circuits. Check A/C-heater control panel connections. If circuits and connections are okay, replace A/C-heater control panel.
5. Check for short to ground in Tan wire. If circuit is okay, set A/C-heater control panel to RECIRC position. Using voltmeter connected to battery voltage, backprobe and measure voltage at vacuum/electric solenoid terminals No. 1 (Light Green/Black wire), 2 (Red wire), 3 (Purple wire), 4 (Tan wire), and 5 (Light Blue wire). If battery voltage is present at terminals No. 2 and 3 and zero volts is present at terminals No. 1, 4 and 5, go to step 7). If voltage is not as specified, go to next step.
6. Check for open or short to battery voltage on Red wire and Purple wire circuits. Check for short to ground in Light Green/Black wire, Tan wire and Light Blue wire circuits. Check A/C-heater control panel connections. If circuits and connections are okay, replace A/C-heater control panel.
7. Check for short to ground in Red wire and Purple wires. If circuit is okay, set A/C-heater control panel to MIDDLE position. Using voltmeter connected to battery voltage, backprobe and measure voltage at vacuum/electric solenoid terminals No. 1 (Light Green/Black wire), 2 (Red wire), 3 (Purple wire), 4 (Tan wire), and 5 (Light Blue wire). If battery voltage is present at terminal No. 3 and zero volts is present at terminals No. 1, 2, 4 and 5, go to step 9). If voltage is not as specified, go to next step.
8. Check for open or short to battery voltage in Purple wire. Check connections at A/C-heater control panel. If circuit and connections are okay, replace A/C-heater control panel.
9. Set A/C-heater control panel to BLEND position. Using voltmeter connected to battery voltage, backprobe and measure voltage at vacuum/electric solenoid terminals No. 1 (Light Green/Black wire), 2 (Red wire), 3 (Purple wire), 4 (Tan wire), and 5 (Light Blue wire). If battery voltage is present at terminal No. 5 and zero volts is present at terminals No. 1, 2, 3, and 4, go to step 11). If voltage is not as specified, go to next step.
10. Check for open or short to battery voltage in Light Blue wire. Check connections at A/C-heater control panel. If circuit and connections are okay, replace A/C-heater control panel.
11. Set A/C-heater control panel to FLOOR position. Using voltmeter connected to battery voltage, backprobe and measure voltage at vacuum/electric solenoid terminals No. 1 (Light Green/Black wire), 2 (Red wire), 3 (Purple wire), 4 (Tan wire), and 5 (Light Blue wire). If battery voltage is present at terminals No. 4 and 5, and zero volts is present at terminals No. 1, 2, and 3, go to step 13). If voltage is not as specified, go to next step.
12. Check for open or short to battery voltage in Tan wire and Light Blue wire circuits. Check connections at A/C-heater control panel. If circuits and connections are okay, replace A/C-heater control panel.
13. Set A/C-heater control panel to DEFOG position. Using voltmeter connected to battery voltage,

backprobe and measure voltage at vacuum/electric solenoid terminals No. 1 (Light Green/Black wire), 2 (Red wire), 3 (Purple wire), 4 (Tan wire), and 5 (Light Blue wire). If battery voltage is present at terminal No. 4 and zero volts is present at terminals No. 1, 2, 3 and 5, go to step 15). If voltage is not as specified, go to next step.

14. Check for open or short to battery voltage in Tan wire. Check connections at A/C-heater control panel. If circuit and connections are okay, replace A/C-heater control panel.
15. Set A/C-heater control panel to defrost. Using voltmeter connected to battery voltage, backprobe and measure voltage at vacuum/electric solenoid terminals No. 1 (Light Green/Black wire), 2 (Red wire), 3 (Purple wire), 4 (Tan wire), and 5 (Light Blue wire). If battery voltage is present at terminals No. 1 and 4, and zero volts is present at terminals No. 2, 3 and 5, A/C-heater control panel is okay. Go to **VACUUM SYSTEM TEST** under TESTING. If voltage is not as specified, go to next step.
16. Check for open or short to battery voltage in Light Green/Black wire and Tan wire circuits. Check connections at A/C-heater control panel. If circuits and connections are okay, replace A/C-heater control panel.

BLOWER INOPERATIVE AT ANY SPEED

1. Check instrument panel fuse No. 17 (20-amp). If fuse No. 17 is open, check for a short to ground in Brown wire circuit between fuse and low speed blower motor relay. Check underhood fuse No. 10 (60-amp). If fuse No. 10 is open, check for a short to ground in Red wire circuit between fuse and high speed blower motor relay.
2. Turn ignition switch to RUN position. Press RECIRC button on A/C-heater control panel. Turn blower motor switch to HI position. Using a test light connected to ground, backprobe high speed blower relay connector terminal No. 30 (Purple wire).
3. If test light does not glow, go to next step. If test light glows, check for open in Purple wire circuit between high speed blower relay and blower motor. Check for open in Black wire circuit between blower motor and ground. Check poor blower motor connection. If all circuits and connections are good, replace blower motor.
4. Using a test light connected to ground, backprobe low speed blower relay connector terminal No. 87 (Yellow wire). If test light does not glow, go to next step. If test light glows, check for poor connections at high speed blower relay. If connections are good, replace high speed blower relay.
5. Using a test light connected to ground, backprobe low speed blower relay connector terminal No. 85 (Brown wire). If test light glows, go to next step. If test light does not glow, check for open in Brown wire circuit between low speed blower motor relay and A/C-heater control panel. If circuit is okay, replace A/C-heater control panel.
6. Using a test light connected to ground, backprobe low speed blower relay connector terminal No. 30 (Brown wire). If test light glows, check for open in Black wire circuit between low speed blower relay and ground. If circuit is okay, replace low speed blower relay. If test light does not glow, repair open or short to ground in Brown wire circuit between low speed blower relay and fuse No. 17 in instrument panel fuse block.

LOW SPEED INOPERATIVE, MEDIUM & HIGH SPEEDS OPERATE NORMALLY

Turn ignition switch to RUN position. Press RECIRC button on A/C-heater control panel. Turn blower motor switch to LO position. Using a test light connected to ground, backprobe blower resistor connector terminal

"A" (Yellow wire). If test light does not glow, check for open in Yellow wire circuit between blower resistor and A/C-heater control panel. If test light glows, check for poor connection at blower resistor connector. If connection is okay, replace blower resistor.

MEDIUM SPEED(S) INOPERATIVE, LOW & HIGH SPEEDS OPERATE NORMALLY

1. Turn ignition switch to RUN position. Press RECIRC button on A/C-heater control panel. Turn blower motor switch to medium-low (M1) position. Using a test light connected to ground, backprobe blower resistor connector terminal "C" (Tan wire).
2. If test light glows, go to next step. If test light does not glow, check for poor connection or open in Tan wire circuit between blower resistor and A/C-heater control panel. If circuit and connections are okay, replace blower motor switch.
3. Turn blower motor switch to medium-high (M2) position. Using test light connected to ground, backprobe blower motor resistor connector terminal "D" (Light Blue wire). If test light does not glow, go to next step. If test light glows, check for poor connection at blower motor resistor. If connection is good, replace blower motor resistor.
4. Check for open circuit and poor connection in Light Blue wire circuit between blower motor resistor and A/C-heater control panel. If circuit and connections are good, replace blower motor switch.

HIGH SPEED INOPERATIVE, LOW & MEDIUM SPEEDS OPERATE NORMALLY

1. Turn ignition switch to RUN position. Press RECIRC button on A/C-heater control panel. Turn blower motor switch to HI position. Using a test light connected to ground, backprobe high speed blower relay connector terminal No. 86 (Orange wire) ground. If test light glows, go to next step. If test light does not glow, go to step 3).
2. Using a test light connected to ground, backprobe high speed blower relay connector terminal No. 87 (Red wire). If test light glows, check for poor connection at high speed blower motor relay and open in Black wire circuit between high speed blower motor relay connector terminal No. 85 and ground. If circuits and connections are good, replace high speed blower motor relay. If test light does not glow, repair open in Red wire circuit between high speed blower motor relay connector terminal No. 87 and underhood fuse No. 10 (60-amp).
3. Using a test light connected to ground, backprobe blower motor switch connector terminal "C" (Orange wire). If test light glows, check for open in Orange wire circuit and poor connection between blower motor switch and high speed blower relay. If test light does not glow, check for poor connection at blower motor switch. If connection is good, replace blower motor switch.

INSUFFICIENT OR NO HEAT

1. Check for low coolant level. Ensure engine operating temperature is approximately 195°F (91°C). If engine operating temperature is not as specified, replace faulty thermostat. Check for kinked heater hose or plugged heater core. Check temperature blend door adjustment and mode door operation. Check that cowl plenum airflow is not restricted.
2. Remove right side trim panel. Open glove box door past its stops. Place ignition switch in RUN position. Slowly move temperature lever from full hot to full cold position and back to full hot. If electric actuator drive shaft rotates while lever is moved, go to step 5). If actuator does not move, go to next step.

3. Turn ignition off. Disconnect electric actuator (air mix motor) connector. Turn ignition switch in RUN position. Using a voltmeter, check voltage a electric actuator connector terminal No. 10 (Brown wire) for battery voltage. If battery voltage is present, go to next step. If battery voltage is not present, repair open in Brown wire circuit.
4. Check that ground is present at electric actuator connector terminal No. 7 (Black wire). If ground is not present, repair open in Black wire circuit. If ground is present, measure voltage at electric actuator connector terminal No. 8 (Dark Blue wire), while moving temperature lever from full hot to full cold. If voltage changes from 12 volts at full hot position to zero volts at full cold, replace electric actuator. If voltage does not change, check for open or short to ground in Dark Blue wire circuit. If wire is okay, replace A/C-heater control panel.
5. If actuator drive shaft moved in step 2), remove electric actuator. Start engine and warm to normal operating temperature. Manually rotate temperature valve shaft from stop to stop. If temperature valve seats in both directions and discharged air changes from ambient air temperature to at least 120°F (49°C), go to next step. If temperature does not change, replace A/C-heater module.
6. Reinstall electric actuator. Place temperature lever in full hot position. Measure temperature at outlet. If temperature is at least 140°F (60°C), system is okay, test is complete. If temperature is not at least 140°F (60°C), replace electric actuator.

INSUFFICIENT OR NO COOLING

1. Ensure instrument panel outlets are open by sliding levers left. Check electric cooling fan for proper operation. Check A/C condenser for debris which obstructs airflow. Ensure A/C is operating properly and that accumulator is cold to touch. Check that cowl plenum air flow is not restricted.
2. Remove right side trim panel. Open glove box door past its stops. Place ignition switch in RUN position. Slowly move temperature lever from full hot to full cold position and back to full hot. Check that electric actuator drive shaft rotates while lever is moved. If actuator moves, go to step 5). If actuator does not move, go to next step.
3. Disconnect electrical actuator (air mix motor) connector. Place ignition switch in RUN position. Using a voltmeter, check voltage at electrical actuator connector terminal No. 10 (Brown wire). If battery voltage is present, go to next step. If battery voltage is not present, repair open in Brown wire circuit.
4. Check that ground is present at actuator connector terminal No. 7 (Black wire). If ground is not present, repair open in Black wire circuit. If ground is present, measure voltage at terminal No. 8 (Dark Blue wire), while moving temperature lever from full hot to full cold. If voltage changes from 12 volts at full hot position to zero volts at full cold, replace electric actuator. If voltage does not change, check for open or short to ground in Dark Blue wire circuit. If wire is okay, replace A/C-heater control panel.
5. If actuator drive shaft moved in step 2), remove electric actuator. Turn A/C on. Manually rotate temperature valve shaft from stop to stop. If temperature valve seats in both directions and discharged air changes from hot to at least 20°F (7°C) cooler than ambient temperature, go to next step. If temperature does not change, replace A/C-heater module.
6. Reinstall actuator. Turn A/C on. Place temperature lever in full cold position. Measure temperature at outlet. If temperature is at least 20°F (7°C) cooler than ambient temperature, system is okay and test is complete. If temperature is not at least 20°F (7°C) cooler than ambient temperature, replace electric actuator.

TESTING

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM procedures in the article, AIR BAG RESTRAINT SYSTEM, in the ACCESSORIES/SAFETY EQUIPMENT section

A/C SYSTEM PERFORMANCE

1. Park vehicle out of direct sunlight. Connect tachometer. Install manifold gauge set. Start engine. Turn A/C on. Place mode selection in A/C position, temperature control on maximum cooling and blower motor switch in HI position.
2. Close doors and windows and open hood. Place a high volume fan in front of radiator to ensure maximum airflow across condenser. Insert thermometer in right center air outlet. Idle engine for 10 minutes. Increase idle to 2000 RPM and measure temperature. Temperatures and pressures should be within correct range. See A/C SYSTEM PERFORMANCE TEMPERATURE SPECIFICATIONS and A/C SYSTEM PERFORMANCE PRESSURE SPECIFICATIONS tables.

A/C SYSTEM PERFORMANCE TEMPERATURE SPECIFICATIONS (1)

Ambient Temp. °F (°C)	Outlet Vent Temp. °F (°C)
70 (21) (2)	42 (6)
70 (21) (3)	43-52 (6-11)
80 (27) (2)	50-52 (10-11)
80 (27) (3)	54-62 (12-17)
90 (32) (2)	54-56 (12-13)
90 (32) (3)	60-72 (15-22)
100 (38) (2)	57-64 (14-18)
100 (38) (3)	69-78 (21-26)

(1) With engine at normal operating temperature and 2000 RPM.

(2) With relative humidity at less than 50 percent.

(3) With relative humidity at 50 percent or more.

A/C SYSTEM PERFORMANCE PRESSURE SPECIFICATIONS (1)

Ambient Temp. °F (°C)	High Side psi (kg/cm^2)	Low Side psi (kg/cm^2)
70 (21) (2)	190-200 (13.4-14.1)	23 (1.6)
70 (21) (3)	200-275 (14.1-19.3)	23-32 (1.6-2.2)
80 (27) (2)	250-285 (17.6-20.0)	30 (2.1)
80 (27) (3)	300-345 (21.1-24.3)	33-41 (2.3-2.9)
90 (32) (2)	300-320 (21.1-22.5)	35 (2.5)
90 (32) (3)	340-380 (23.9-26.7)	39-49 (2.7-3.4)

100 (38) (2)	330-370 (23.2-26.0)	37-43 (2.6-3.0)
100 (38) (3)	375-385 (26.4-27.1)	47-55 (3.3-3.9)

(1) With engine at normal operating temperature and 2000 RPM.

(2) With relative humidity at less than 50 percent.

(3) With relative humidity at 50 percent or more.

VACUUM SYSTEM TEST

1. With engine idling, check for vacuum at Violet vacuum supply hose at vacuum/electric solenoid. See **Fig. 2**. If approximately 1 5 in. Hg vacuum is present, turn engine off. Vacuum should remain at approximately 15 in. Hg with engine off. If vacuum is present as described, go to next step. If vacuum is not present as described, check and repair leak, kink or restriction in Violet vacuum supply hose.
2. Disconnect vacuum connector from vacuum/electric solenoid. With engine idling, use a 3-inch piece of vacuum hose connected to vacuum source. Apply vacuum to each air door actuator vacuum line. See **Fig. 2**. See ACTUATOR HOSE IDENTIFICATION table. If all air door actuators fully open and close, go to next step. If any air door actuator does not fully open or close, check for leaking or restricted vacuum line to actuator. Check for defective valve actuator or binding linkage. Repair or replace as necessary.

ACTUATOR HOSE IDENTIFICATION

Actuator	Hose Color
Defroster Valve Actuator (Defrost)	Grey
Defroster Valve Actuator (Heater)	Blue
Air Inlet Valve Actuator	Orange
Mode Valve Actuator (Lower)	Red
Mode Valve Actuator (Upper)	Tan

3. Reconnect all vacuum and electrical connections. Run engine and cycle through operating modes of A/C-heater control panel while observing vacuum actuators. Check for vacuum to actuators by observing actuator position. When vacuum is applied, actuator should retract.
4. To determine correct vacuum supply to each actuator, see AIR DELIVERY VACUUM DISTRIBUTION table. If actuator retracts when it should not, replace A/C-heater control panel after performing AIR FLOWS FROM WRONG OUTLETS trouble shooting procedure. If actuator does not retract when it should, check for vacuum leaks, collapsed vacuum hoses or binding air valves. If actuator operation is okay, A/C-heater control panel.

AIR DELIVERY VACUUM DISTRIBUTION

A/C-Heater Control Panel Position	Vacuum Applied To Actuator Hose
AUTO/ECON 60°F (16°C)	(1) Orange & (2) Tan
AUTO/ECON 90°F (32°C)	(3) Red & (4) Blue
OFF	(3) Red
DEF	(5) Gray & (3) Red

DEFOG	(3) Red
BLEND	(4) Blue

(1) Air inlet valve actuator.

(2) Upper mode valve actuator.

(3) Lower mode valve actuator.

(4) Defroster valve actuator (heater).

(5) Defroster valve actuator (defroster).

REMOVAL & INSTALLATION

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all SERVICE PRECAUTIONS and DISABLING & ACTIVATING AIR BAG SYSTEM procedures in the article, AIR BAG RESTRAINT SYSTEM, in the ACCESSORIES/SAFETY EQUIPMENT section

A/C-HEATER CONTROL PANEL

Removal & Installation

Disconnect negative battery cable. Remove instrument panel trim plate. Remove top control panel attaching screws. Pull A/C-heater control panel out far enough to reach behind and disconnect electrical connector. Remove A/C-heater control panel. To install, reverse removal procedure.

A/C COMPRESSOR RELAY

Removal & Installation

Disconnect negative battery cable. Disconnect A/C compressor relay. Remove attaching screw from multi-use bracket on right front wheelwell. Remove A/C compressor relay. To install, reverse removal procedure.

ACCUMULATOR

Removal

Discharge A/C system, using approved refrigerant recovery/recycling equipment. Disconnect refrigerant lines at accumulator and seal openings. Loosen clamp and remove accumulator assembly.

Installation

Add 3.5 ounces of clean refrigerant oil. To install, reverse removal procedure. Use new "O" rings. Evacuate, charge, and leak test system.

AIR INLET VACUUM ACTUATOR

Removal & Installation

1. Remove instrument panel. See INSTRUMENT PANEL. Disconnect Orange vacuum hose connector at air inlet valve actuator by sliding tab of connector retainer past L-shaped bend in vacuum hose.
2. Slide connector off hose while continuing to hold tab back against body of connector. Using a thin-blade screwdriver, disengage catch locking air inlet valve actuator to A/C-heater module, and slide actuator away to remove it.
3. To install, reverse removal procedure. Engage slot in air inlet valve actuator arm with hook of air inlet valve arm. To lock actuator to module, slide air inlet valve actuator into place until catch clicks.

BLOWER MOTOR RESISTOR & RELAY

Removal & Installation

1. Disconnect negative battery cable. Remove 4 retaining screws from rear edge of right sound insulator. Pull sound insulator straight back until 2 locator studs at forward edge of insulator disengage. Remove sound insulator.
2. Disconnect blower motor resistor. Remove 3 blower motor resistor mounting screws, and guide blower motor resistor of bottom of A/C-heater module. Disconnect high speed blower relay. Remove relay retaining screw, and remove high speed blower relay from A/C-heater module. To install, reverse removal procedure.

COMPRESSOR

Removal

1. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Remove mechanical fan shroud and fan blade (if equipped). Store fan clutch in an upright position to keep oil from leaking from clutch. Raise and support vehicle. Remove compressor drive belt and tensioner assembly.
2. Disconnect electrical connector. Disconnect refrigerant lines, and plug openings. Remove support braces from rear of compressor. Remove long studs and bolt. Remove compressor.

Installation

To install, reverse removal procedure. Add one ounce of refrigerant oil if one ounce or less is drained from old compressor. If more than one ounce of refrigerant is drained from old compressor, add the same amount. Use new sealing washers. Evacuate, charge, and leak test system.

CONDENSER

Removal

1. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Remove air intake duct and resonators. Disconnect negative battery cable. Remove mechanical fan shroud and fan blade (if equipped). Store fan clutch in an upright position to keep oil from leaking from clutch. Remove electric cooling fans and shroud (if equipped). Remove upper mounting panel (if equipped).

2. Disconnect refrigerant lines at condenser and seal openings to prevent contamination. Remove bolts from radiator support. Tilt top of radiator rearward and slide condenser out between radiator and support. Remove condenser from vehicle.

Installation

To install, reverse removal procedure. If condenser is new or was drained, add one ounce of clean refrigerant oil. Evacuate, charge, and leak test system. Fill cooling system.

DEFROST VALVE VACUUM ACTUATOR

Removal & Installation

1. Remove 2 screws, and unsnap and remove steering column opening filler. Disconnect vacuum hose connector at defrost actuator by sliding tab of connector retainer past L-shaped bend in vacuum hose. Slide connector off hose while continuing to hold tab back against body of connector.
2. Using a thin-blade screwdriver, disengage catch locking defrost valve actuator to A/C-heater module, and slide defrost valve actuator away to remove.
3. To install, reverse removal procedure. Engage slot in defrost valve actuator arm with hook of defrost valve crank. To lock actuator to module, slide defrost valve actuator into place until catch clicks.

ELECTRIC ACTUATOR

Removal & Installation

1. Disconnect negative battery cable. Remove glove box. Disconnect electrical connector from actuator. Remove two actuator attaching screws. Pull actuator straight rearward and off temperature valve shaft.
2. To install, reverse removal procedure. When installing actuator, align metal drive sleeve of actuator with flats on temperature valve shaft and press actuator straight forward.

EVAPORATOR CORE

Removal & installation

1. Discharge A/C system, using approved refrigerant recovery/recycling equipment. Remove nuts securing refrigerant lines to evaporator cowl fitting. Remove lines, and plug openings. Remove heater core cover. See HEATER CORE COVER. Remove evaporator mounting bracket screw and bracket.
2. Slide evaporator rearward and then down to remove. To install, reverse removal procedure. Install new "O" rings on refrigerant lines. Evacuate, charge, and leak test system.

HEATER CORE COVER

NOTE: Heater core cover must be removed from A/C-heater module to access evaporator, heater core and other components.

Removal

1. Remove right instrument panel sound insulator. Remove nut from shroud panel stud. Remove screw from instrument panel. Remove instrument panel lower reinforcement. Disconnect 2 vacuum harness connectors at lower evaporator case. Position vacuum harnesses aside. Pull right hinge pillar trim finish panel away from front body hinge pillar. Roll carpet back to access lower front area of A/C-heater module.
2. Remove 7 screws attaching flange of lower evaporator case to A/C-heater module. Evaporator case attaching screw on forward flange next to cowl panel may be difficult to locate. Screw head is straight down from vacuum tank and almost directly below lower right side heater core tube. Remove lower evaporator case.

Installation

To install, reverse removal procedure. Clean original sealant from mating surfaces. Apply new sealant to lower evaporator case mounting flanges. Carefully guide lower evaporator case into place without scraping any sealant from flanges.

HEATER CORE

Removal & Installation

Drain engine coolant. Remove screw securing heater outlet pipe to cowl panel. Remove heater inlet and outlet quick-connect fittings. Remove heater core cover. See HEATER CORE COVER. Remove heater core mounting straps and screws. Pull heater rearward, working heater core tubes out of seal. Remove heater core. To install, reverse removal procedure. Refill cooling system with coolant, and check for leaks.

INSTRUMENT PANEL

Removal

1. Disable air bag system. See AIR BAG RESTRAINT SYSTEM article in the ACCESSORIES/SAFETY EQUIPMENT section. Remove steering column opening filler. Remove 4 knee bolster-to-deflector attaching bolts, and remove bolster. Remove 4 knee deflector-to-tie bar bolts, and remove deflector. Remove brakelight switch. Unclip and remove shift indicator cable.
2. Remove nuts attaching steering column support bracket to instrument panel. Gently lower steering column. Remove 2 bolts attaching steering column guide bracket to instrument panel. Remove steering column guide bracket. Remove right and left trim plates. Remove sound insulator. Remove 4 instrument cluster attaching screws, and remove instrument cluster.
3. Remove headlight switch and accessory switches. Remove parking brake release handle. Remove multifunction alarm module. Remove A/C-heater control panel. See A/C-HEATER CONTROL PANEL. Remove 3 radio bracket-to-instrument panel screws. Pull radio and bracket from instrument panel. Disconnect electrical connectors and antenna from radio, and remove radio.
4. Remove ashtray/lighter assembly. Remove retainer attaching instrument panel light switch assembly to instrument panel, and remove switch assembly. Remove courtesy lights. Remove low oil module and Data Link Connector (DLC).
5. Remove right and left sound covers. Remove 4 bolts attaching instrument panel to lower windshield frame. Remove 2 bolts attaching instrument panel to each door pillar.

NOTE: Mark harness connectors, hose and harness routing before removal.

6. Remove lower reinforcement-to-instrument panel bolt. Unsnap and pull instrument panel from windshield frame flange. Disconnect remaining electrical and vacuum hose connectors.

Installation

To install, reverse removal procedure. Place instrument panel into vehicle. Route wiring harness and connectors according to marks made during removal.

MODE VALVE VACUUM ACTUATOR

Removal & Installation

1. Remove right instrument panel sound insulator by removing 4 retaining screws from upper edge of sound insulator. Pull sound insulator straight back until 2 locator studs at forward edge are disengaged.
2. Disconnect Tan vacuum hose connector at mode valve actuator by sliding tab of connector retainer past L-shaped bend in vacuum hose. Slide connector off hose while continuing to hold tab back against body of connector.
3. Disconnect Red vacuum hose connector by lifting tab off arrow and sliding connector off of vacuum hose. Using a thin-blade screwdriver, disengage catch locking mode valve actuator to A/C-heater module, and slide mode valve actuator away to remove it.
4. To install, reverse removal procedure. Engage slot in mode valve actuator arm with hook of mode valve crank. To lock actuator to module, slide mode valve actuator into place until catch clicks. To complete installation, reverse removal procedure.

PRESSURE CYCLING SWITCH

Removal & Installation

Disconnect negative battery cable. Disconnect pressure cycling switch. Pressure cycling switch is mounted on a Schrader-type valve; discharging refrigerant from system is not necessary. Unscrew switch, and remove "O" ring. To install, coat new "O" ring with refrigerant oil. Install pressure cycling switch, and tighten to 40 INCH lbs. (5 N.m). Connect negative battery cable.

VACUUM/ELECTRIC SOLENOID

Removal & Installation

Disconnect negative battery cable. Remove right hand instrument panel sound insulator. Disconnect electrical connector from solenoid. Remove two screws attaching solenoid to evaporator case. Remove solenoid with vacuum manifold attached. Remove manifold by releasing retainers holding it to solenoid. To install, reverse removal procedure.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
A/C Compressor Bolt	37 (50)
A/C Compressor Bracket Bolts/Nuts	24 (33)
A/C Compressor Rear Bracket Bolts	30 (41)
A/C Compressor Stud	37 (50)
Drive Belt Tensioner Bolt	24 (33)
Refrigerant Hoses (Aluminum Tubing)	
3/8" Diameter	12 (16)
1/2" Diameter	17 (23)
3/4" Diameter	24 (33)
Refrigerant Hoses (Steel Tubing)	
3/8" Diameter	30 (41)
1/2" Diameter	30 (41)
3/4" Diameter	30 (41)
	INCH Lbs. (N.m)
Accumulator-Drier Bolt	53 (6)
Blower Motor Screws	17 (2)
Condenser Bolts	53 (6)
Control Panel Screws	17 (2)
Heater/Evaporator Case Nuts	53 (6)
Heater/Evaporator Case Screws	25 (3)
Instrument Panel	
Center Reinforcement Bolts	89 (10)
Panel-To-Cowl Bolts	89 (10)
Pressure Cycling Switch	40 (5)

VACUUM HOSE DIAGRAM(S)

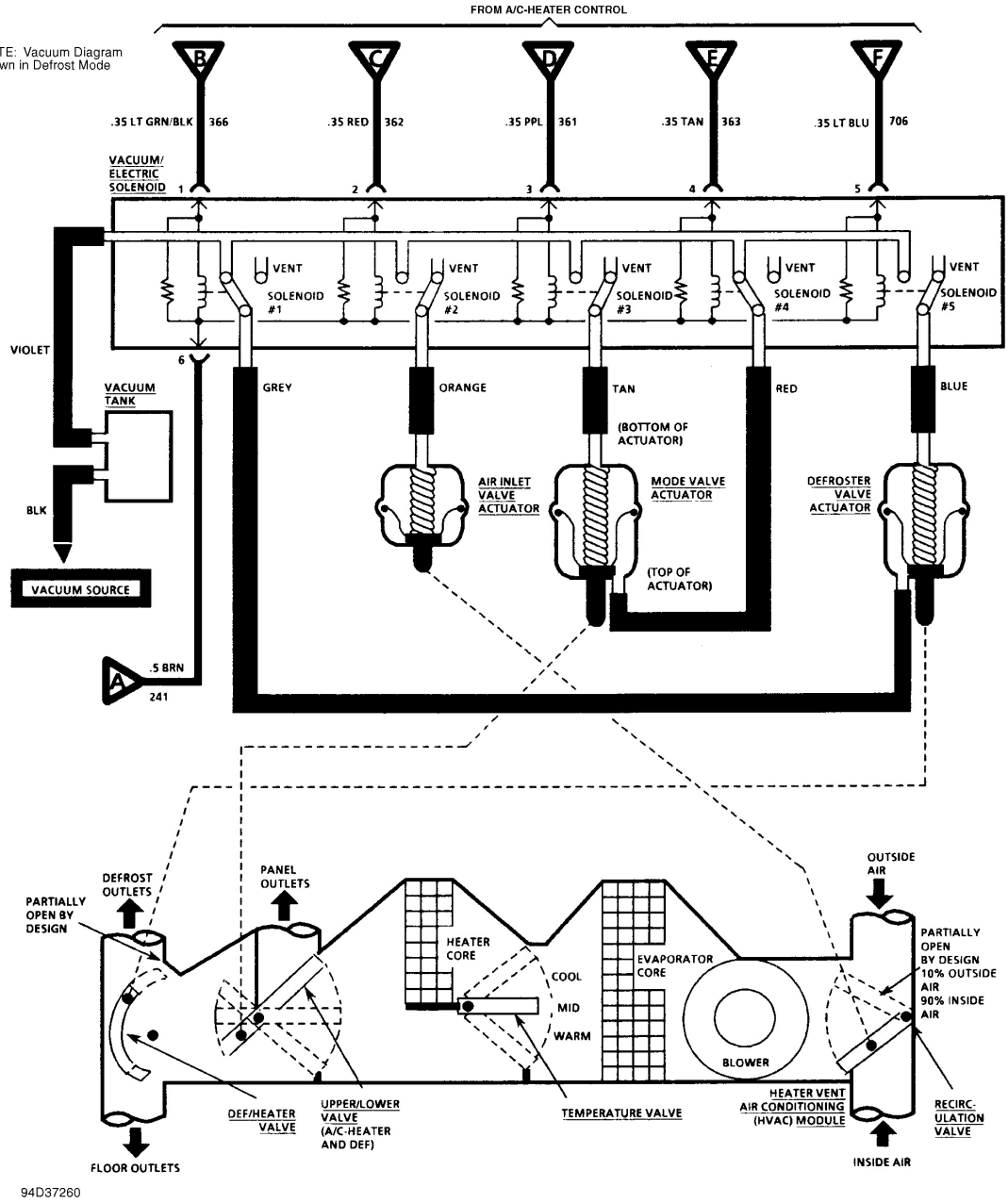


Fig. 2: Manual A/C-Heater System Vacuum Diagram
Courtesy of GENERAL MOTORS CORP.

WIRING DIAGRAM

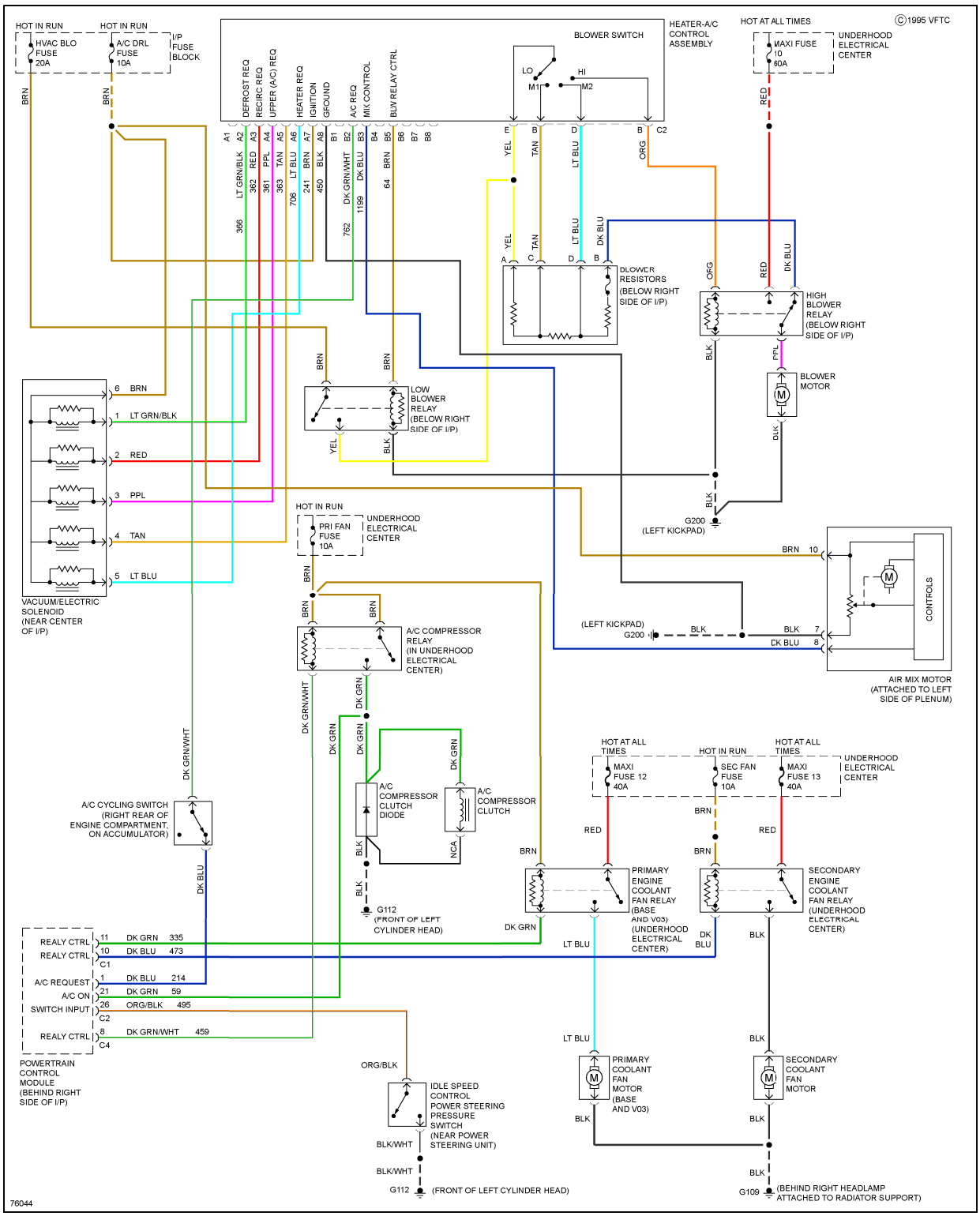

HOT IN RUN
HOT IN RUN
HVAC BLO FUSE 20A
A/C DRL FUSE 10A
I/P FUSE BLOCK
HEATER-A/C CONTROL ASSEMBLY
BLOWER SWITCH
HOT AT ALL TIMES
MAXI FUSE 10 60A
UNDERHOOD ELECTRICAL CENTER
©1995 VFTC
DEFROST REQ
RECIRC REQ
UPPER (A/C) REQ
HEATER REQ
IGNITION
GROUND
A/C REQ
MIX CONTROL
BLW RELAY CTRL
LO
HI
M1
M2
BLOWER RESISTORS (BELOW RIGHT SIDE OF I/P)
HIGH BLOWER RELAY (BELOW RIGHT SIDE OF I/P)
BLOWER MOTOR
LOW BLOWER RELAY (BELOW RIGHT SIDE OF I/P)
G200 (LEFT KICKPAD)
VACUUM/ELECTRIC SOLENOID (NEAR CENTER OF I/P)
HOT IN RUN
PRI FAN FUSE 10A
UNDERHOOD ELECTRICAL CENTER
A/C COMPRESSOR RELAY (IN UNDERHOOD ELECTRICAL CENTER)
CONTROLS
AIR MIX MOTOR (ATTACHED TO LEFT SIDE OF PLENUM)
A/C CYCLING SWITCH (RIGHT REAR OF ENGINE COMPARTMENT, ON ACCUMULATOR)
A/C COMPRESSOR CLUTCH DIODE
A/C COMPRESSOR CLUTCH
G112 (FRONT OF LEFT CYLINDER HEAD)
HOT AT ALL TIMES
HOT IN RUN
HOT AT ALL TIMES
MAXI FUSE 12 40A
SEC FAN FUSE 10A
MAXI FUSE 13 40A
UNDERHOOD ELECTRICAL CENTER
PRIMARY ENGINE COOLANT FAN RELAY (BASE AND V03) (UNDERHOOD ELECTRICAL CENTER)
SECONDARY ENGINE COOLANT FAN RELAY (UNDERHOOD ELECTRICAL CENTER)
POWERTRAIN CONTROL MODULE (BEHIND RIGHT SIDE OF I/P)
REALY CTRL
REALY CTRL
A/C REQUEST
A/C ON
SWITCH INPUT
REALY CTRL
IDLE SPEED CONTROL, POWER STEERING PRESSURE SWITCH (NEAR POWER STEERING UNIT)
PRIMARY COOLANT FAN MOTOR (BASE AND V03)
SECONDARY COOLANT FAN MOTOR
G112 (FRONT OF LEFT CYLINDER HEAD)
G109 (BEHIND RIGHT HEADLAMP ATTACHED TO RADIATOR SUPPORT)
76044

Fig. 3: Manual A/C-Heater System Wiring Diagram